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घरेलू गद्दे के लिए  
लचीले पॉलीयूरेथेन फोम — विशिष्टि  
( पहला पुनरीक्षण )

**Flexible Polyurethane  
Foam for Domestic Mattresses —  
Specification**  
( *First Revision* )

ICS 83.140.01

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## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Rubber and Rubber Products Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

This standard was published in 1975 to ensure the production and supply of satisfactory quality of material.

With the technological changes additives, processing methods and application methodology have significantly changed. However, the basic chemistry remains the same. While revising the standard, requirements of the standard have been updated in consultation with Indian Polyurethane Association (IPUA), New Delhi and stakeholders like raw material suppliers, processors, mattress manufacturers and subject matter experts.

In this revision, two commonly used polyurethane foams in mattresses, polyurethane foam and visco-elastic foam also called memory foam have been included. This is because of the new developments of raw materials, processing and also keeping in mind the need for recycling of products looking from a long term sustainability point of view. Since the time the original Standard was published, there have been changes in various parameters like density, indentation hardness, etc. Accordingly, values have been given for core, comfort and quilting layers separately. Also the mention of certain adhesives by name or class have been omitted because it should be left to the manufacturer to use the best and correct product for its application.

The composition of the Committee responsible for formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values ( *second revision* )'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## *Indian Standard*

# FLEXIBLE POLYURETHANE FOAM FOR DOMESTIC MATTRESSES — SPECIFICATION

( *First Revision* )

### 1 SCOPE

This standard prescribes the requirements, methods of sampling and test for flexible polyurethane foam for domestic mattresses.

### 2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
2828 : 2019	Plastics — Vocabulary ( <i>second revision</i> )
7888 : 1976	Methods of test for flexible polyurethane foam

### 3 TYPES

The flexible polyurethane foam for domestic mattresses shall be of the following two types:

- a) *Type 1* — Flexible polyurethane foam for domestic mattresses with a quilting layers.
- b) *Type 2* — Visco-elastic foam for domestic mattresses with quilting layers.

### 4 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 2828 and IS 7888 shall apply.

### 5 REQUIREMENTS

#### 5.1 Constituents

The mattress core shall be flexible polyurethane foam of polyether or polyester type which is defined as expanded cellular product produced by interaction of poly-hydroxy compounds, water and isocyanate. The foam shall consist of cells of regular characteristics which are essentially open and inter-connecting. The core may be of one or two or more layers of different densities provided that the properties of the whole core comply with the requirements specified in clause

numbers 5.4 to 5.8. Different constructional designs like full foam, laminated layers, profiled layers etc are also permitted. However, in case of re-bonded polyurethane foam for domestic mattress shall be made from only polyurethane foam scrap, devoid of any other types of plastics or any other foreign material.

5.2 The foam core shall be clean in appearance and free from odour.

5.3 Colour of the polyurethane foam shall be as agreed between the supplier and the purchaser.

#### 5.4 Dimensions and Tolerances

##### 5.4.1 Dimensions

The length and width of the polyurethane foam shall be as agreed between the supplier and the purchaser. However, the minimum thickness of the polyurethane foam shall be 75 mm and this does not apply to foams used in hybrid or other types of mattresses like coir, spring etc.

##### 5.4.2 Tolerances

The tolerances on length, width shall be  $\pm 1$  percent and on thickness  $\pm 3$  percent.

#### 5.5 Indentation Hardness Characteristics (for Type 1 and 2)

The load quotient determined as prescribed in clauses 6.3.1 and 6.3.2 of IS 7888 with a sample of 380 mm  $\times$  380 mm  $\times$  100 mm. It shall not be less 1.9:1 for Type 1 and 1 : 1 for Type 2. When the thickness of the specimen is not representative of the mattress core as a whole in the laminates or profiled construction the test shall be performed on the complete thickness of the core.

#### 5.6 Indentation Hardness Index (for Type 1 and 2) —

Indentation hardness Index is the load required to produce a deflection of 40 percent of initial thickness of the sample in accordance with the method described in clause 6.3.3 of IS 7888. The value shall be agreed to between the supplier and the purchaser. When the thickness of the test specimen is not representative of the core as in the case of laminates or profiled construction the test shall be performed on the complete thickness of the core.

**5.7 Durability (for Type 1 and 2)** — When the foam sample is subjected to the fatigue test as described in 7 of IS 7888, the loss in 25 percent indentation hardness characteristics tested as specified in 5.5 shall not be more than 30 percent of the initial value and the reduction in thickness shall not be more than 10 percent of the initial value.

**5.8** The polyurethane foam shall also comply with the requirements given in Table 1 when tested as prescribed in Col 5 of the Table 1.

## 6 PACKING AND MARKING

### 6.1 Packing

The material shall be packed as agreed between by supplier and the purchaser.

NOTE — To avoid deterioration of foam mattresses during storage, it shall be kept in well-ventilated rooms edgewise away from direct sunlight and not exposed to ultra-violet rays.

### 6.2 Marking

**6.2.1** The packages shall be marked with the following information by a non-staining ink:

- a) Name of the manufacturer and trademark, if any;
- b) Lot or batch number; c) Date of manufacturer;
- d) Dimensions of the mattress;
- e) Density of the foam; and
- f) Any other statutory requirements.

### 6.2.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

## 7 SAMPLING

The sampling shall be done as prescribed in 12 of IS 7888.

**Table 1 Requirements for Polyurethane Foam**

( Clause 5.8 )

Sl No.	Characteristics	Type		Method of Test, Refer To,
		Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)
i)	Density, kg/m <sup>3</sup> , <i>Min</i>			4 of IS 7888
	a) Polyurethane foam	21	-	
	b) Visco-elastic polyurethane foam	-	32	
	c) Comfort layer polyurethane foam	18	21	
	d) Quilting layer polyurethane foam	12	21	
ii)	Tensile strength, kg/cm <sup>2</sup> , <i>Min</i>	1	0.5	5 of IS 7888
iii)	Heat ageing	Tensile strength shall not be less than 70 percent of the initial value		10 of IS 7888
iv)	Compression set, percent, <i>Max</i>	10	10	8 of IS 7888

## ANNEX A

( Foreword )

## COMMITTEE COMPOSITION

Rubber and Rubber Products Sectional Committee, PCD 13

<i>Organization</i>	<i>Representative(s)</i>
The Rubber Board, Kottayam	DR SIBY VARGHESE ( <b>Chairman</b> )
All India Rubber Industries Association, Mumbai	SHRI SRIKANTH KRISHNAMURTHY SHRI CHINMOY RAY ( <i>Alternate</i> )
Association of Planters of Kerala, Kerala	SHRI SANTOSH KUMAR SHRI PHILIP C. JACOB ( <i>Alternate</i> )
Automotive Tyres Manufacturers Association (ATMA), New Delhi	SHRI NITEESH K. SHUKLA SHRI RAJIV BUDHRAJA ( <i>Alternate</i> )
Block Rubber Processor's Association of India	SHRI RAJIV THARIAN SHRI RONNY JOSEPH ( <i>Alternate</i> )
Ministry of Defence (DGQA), New Delhi	SHRI S. K. SAXENA SHRI V. K. CHHABRA ( <i>Alternate</i> )
Dow Corning India Pvt Ltd, Flame Retardants Association of India, Gurugram	SHRI SUBHRANSHU GUPTA SHRI P. V. MURALI MOHAN
GRP Limited, Mumbai	SHRI KALYAN DAS
HASETRI, Rajasthan	SHRI SAIKAT DAS GUPTA
Indian Oil Corporation R and D Centre, Faridabad, Haryana	DR DEEPAK SAXENA DR PANKAJ BHATNAGAR ( <i>Alternate</i> )
Indian Rubber Manufacturers Research Association (IRMRA), Mumbai	DR K. RAJKUMAR DR BHARAT KAPGATE ( <i>Alternate</i> )
Indian Synthetic Rubber Private Limited (ISRPL), Noida	SHRI LALIT KUMAR SHARMA SHRI BHANU PRATAP SINGH ( <i>Alternate</i> ) SHRI TUHIN KANTI DAS ( <i>Young Professional</i> )
KA Prevulcanized, Tamilnadu	SHRI PRAVEEN MATHEW
LPG Equipment Research Centre, Bengaluru	SHRI NARESH GERA SHRI A. KRISHNA KUTTY ( <i>Alternate</i> )
LANXESS India Private Limited, Kolkata	SHRI ARIDAMAN GHOSH
MRF Tyres	SHRI G. SHYJU Ms P. IDUMATHI ( <i>Alternate</i> )
Newage Fire Protection Industries Pvt Ltd	SHRI BHARAT J. SHAH SHRI JAYANT SINHA ( <i>Alternate</i> )
Rado Industries Limited, Faridabad	SHRI KAILASH GUPTA
Reliance Industries Ltd (Elastomers Business), Vadodara	DR ABHIJIT ADHIKARY MR SHAMBHU LAL AGRAWAL ( <i>Alternate</i> )
Research, Designs and Standards Organization, Lucknow	SHRI MNJESH KUMAR SHRI RAVI PRAKASH ( <i>Alternate</i> )
Shri Sati Rubber Industries, Jaipur	SHRI VIJAY KUMAR AGARWAL SHRI SUDHIR AGARWAL ( <i>Alternate</i> )
Voluntary Organization in Interest of Consumer Education (VOICE), New Delhi	SHRI M. A. U. KHAN SHRI H. WADHWA ( <i>Alternate</i> )
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BIS Directorate General	SHRIMATI NAGAMANI. T, SCIENTIST 'E' AND HEAD (PCD) [ REPRESENTING DIRECTOR GENERAL ( <i>Ex-officio</i> ) ]

*Member Secretary*  
SHRI VIJAY KUMAR GUPTA  
SCIENTIST 'D' (PCD), BIS



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### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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